Massachusetts Department of Environmental Protection
Source Water Assessment and Protection (SWAP) Report
for
Village Greene Condominium Association

What is SWAP?

The Source Water Assessment Program (SWAP), established under the federal Safe Drinking Water Act, requires every state to:

? Inventory land uses within the recharge areas of all public water supply sources;

? Assess the susceptibility of drinking water sources to contamination from these land uses; and

? Publicize the results to provide support for improved protection.

SWAP and Water Quality

Susceptibility of a drinking water source does *not* imply poor water quality. Actual water quality is best reflected by the results of regular water tests.

Water suppliers protect drinking water by monitoring for more than 100 chemicals, treating water supplies, and using source protection measures to ensure that safe water is delivered to the tap.

Prepared by the Massachusetts Department of Environmental Protection, Bureau of Resource Protection, Drinking Water Program

Date Prepared:
October 16, 2003

Table 1: Public Water System (PWS) Information

PWS NAME	**Village Green Condominium Association**
PWS Address	**40 Ware Road**
City/Town	**Belchertown, Massachusetts**
PWS ID Number	**1024016**
Local Contact	**Mr. John Sullivan**
Phone Number	**413-323-0649**

Well Name	*Source ID#*	*Zone I (in feet)*	*IWPA (in feet)*	*Source Susceptibility*
Well Bldg #1	1024016-01G	100	410	Moderate
Well Bldg #2	1024016-02G	100	410	Moderate
Well Bldg #3	1024016-03G	100	410	Moderate
Well Bldg #4	1024016-04G	100	410	Moderate
Well Bldg #5 & #8	1024016-05G	100	415	High
Well Bldg #6	1024016-06G	100	410	High
Well Bldg #7	1024016-07G	100	410	High
Well Bldg #9	1024016-08G	100	410	High
Well Bldg #10	1024016-09G	240	592	Moderate

Introduction

We are all concerned about the quality of the water we drink. Drinking water wells may be threatened by many potential sources of contamination, including septic systems, road deicing, and improper disposal of hazardous materials. Citizens and local officials can work together to better protect these drinking water sources.

Purpose of this report:
This report is a planning tool to support local and state efforts to improve water supply protection. By identifying land uses within water supply protection areas that may be potential sources of contamination the assessment helps focus protection efforts on appropriate best management practices (BMPs) and drinking water source protection measures. Department of Environmental Protection (DEP) staff are available to provide information about funding and other resources that may be available to your community.

This report includes:
1. Description of the Water System
2. Discussion of Land Uses within Protection Areas
3. Recommendations for Protection
4. Attachments, including a Map of the Protection Areas

1. Description of the Water System

Village Greene Condominium Association (Association) is a small, residential condominium community in Belchertown, with twenty-one homes in ten buildings. Although Belchertown has municipal water and sewer, the area where the Association is located, is not connected to either the municipal water or sewer systems. Therefore, the Association homes as well as the surrounding homes and facilities, are served by on-site septic disposal systems and non-municipal, public or private water supplies. The Association maintains nine water supply wells 01G through 09G with one well per building with the exception of one source (05G) that serves two buildings. Wells 01G through 07G are clustered together in the southeastern section of the property and are located distances ranging from approximately 60 to 80 feet apart. There presently, is no metered flow data to determine actual water use from each well. The one exception is well 09G, which is a flowing artesian well that free flows at an estimated rate of 6 gallons per minute (gpm) or 8,640 gallons per day (gpd). The estimated water use from each of the other wells (01G through 08G) was based on the Title 5 septic system design flow volumes of 110 gallons per bedroom. Therefore the estimated use from each well is less than 1,000 gallons per day.

The Zone I is the protected area immediately surrounding the wellhead, while the Interim Wellhead Protection Area provides an interim protection area for a water supply well when the actual recharge area has not been delineated. The actual recharge area to the well may be significantly larger or smaller than the IWPA. The Zone I and IWPAs are based on the amount of water withdrawn from each well. Wells 01G through 08G have an estimated use of less than 1,000 gallons per day. The Zone I radius for wells 01G through 08G, based on estimated use, is 100 feet. The IWPA radius for wells 01G, 02G, 03G, 04G, 06G, 07G and 08G is 410 feet. The IWPA radius for well 05G is 415 feet because it serves two buildings and is assumed to use more water. The Zone I and IWPA radii for well 09G are 240 feet and 592 feet, respectively, based on the free flow rate of 6 gpm.

There is very little data available about the wells, other than the pumps are set at

What is a Protection Area?

A well's water supply protection area is the land around the well where protection activities should be focused. Each well has a Zone I protective radius and an Interim Wellhead Protection Area (IWPA).

- **The Zone I** is the area that should be owned or controlled by **the** water supplier and limited to water supply activities.
- **The IWPA** is the larger area that is likely to contribute water to the well.

In many instances the IWPA does not include the entire land area that could contribute water to the well. Therefore, the well may be susceptible to contamination from activities outside of the IWPA that are not identified in this report.

Table 2: Table of Activities within the Water Supply Protection Areas

Potential Contaminant Sources	Zone I	IWPA	Threat	Comments
Non-conforming Zone I	Wells 05G–09G	--	--	Septic systems, homes, parking, roadway
Hazardous materials storage and use	--	Well 09G	High	Encourage the Board of Health to inspect facilities to encourage the use of BMPs and assist in regulatory compliance.
Septic systems	05G –07G	All	Moderate /High	Microbial contaminants and potentially hazardous materials from improper disposal.
High density residential with on-site parking	Wells 05G–09G	All	Moderate	Use BMPs for household hazardous waste, heating fuel, septic system management, and lawn care and stormwater runoff.
Gravel operation	--	Wells 01G-07G	Moderate	Accidental release from heavy equipment, potential for illegal dumping
Transportation corridor: local roads and State Route 9	08G	08G & 09G	Moderate	Limit road salt usage and provide drainage downgradient from wells

*** -For more information on Contaminants of Concern associated with individual facility types and land uses please see the SWAP Draft Land Use / Associated Contaminants Matrix on DEP's website - www.state.ma.us/dep/brp/dws/.**

approximately 70 to 80 feet below grade. Well drilling invoices obtained from the Belchertown Board of Health for the Association's wells, show the depths to which the wells were drilled and the amount of casing used to complete the well. Based on that information, it was determined that all of the wells are completed in bedrock and range in depth from 80 to 125 feet deep. There are no drillers' records available of the type of material encountered during drilling. The geologic maps published for the area indicate stratified glacial drift (sand and gravel deposits) to depths of approximately 60 feet. The maps do not indicate a continuous clay protective layer in the area. A well log for a recently installed well on an adjacent property indicated a clay layer at a depth of approximately 30 feet. However, there is no indication of a continuous confining protective clay unit in the area. The bedrock in the area is mapped as quartz monzodiorite gneiss associated with the Belchertown Complex and is highly folded and faulted rock. Wells located in this type of hydrogeologic environment are considered to have a high vulnerability to contamination due to the absence of a continuous hydrogeologic barrier that can prevent contaminant migration from activities conducted on the ground surface in the immediate vicinity of the well(s).

The wells serving the facility do not have treatment at this time. For current information on water quality monitoring results, please request a copy of the most recent Consumer Confidence Report from the Public Water System contact person listed above in Table 1. Please refer to the attached map of the Zone I and IWPA and Table 1 for additional information regarding the location of the well and activities within the protection areas.

2. Discussion of Land Uses in the Protection Areas

The protection areas for the wells are entirely within the town of Belchertown and include several activities that pose a threat to the water supplies.

Key issues include:

1. **Non-conforming activities within Zone I,**
2. **Residential land uses with on-site septic disposal and parking,**
3. **Transportation corridors,**
4. **Hazardous materials handling, and**
5. **Comprehensive Protection Planning.**

The overall ranking of susceptibility to contamination for the Village Greene Condominium Association is high, based on the presence of at least one high theat ranked land use or activity in the Zone I and IWPA of one of the sources. Please refer to Table 2 for more details.

1. Non-conforming activities within Zone I – Currently, the water supplier does not own or control the entire Zone I area for the sources. Systems not meeting DEP Zone I requirements for ownership or control, must get DEP approval and address Zone I ownership prior to increasing water use or modifying systems. The Zone I for Wells 05G through 07G have portions of septic systems within the Zone I protection area. One or two of the cesspools on site either are in failure or are anticipated to be in failure in the near future. Therefore, the threat ranking for the septic systems has been increased from a moderate to a high-risk ranking. The Zone I for well 09G includes one of the residential units and it's yard and a portion of Route 9. The Zone I for well 08G includes residential units, driveways, roadways and at least one septic system. Well 08G is secured within a cement covered pit in the driveway of one of the units.

Recommendations:

- To the extent feasible, remove all non-water supply activities from the Zone I to comply with DEP's Zone I requirements. Prohibit new non-water supply activities in the Zone I.
- Inspect the ground around the casings and the integrity of the casings and caps to ensure the wells are protected from surface influences and the caps are secure.

Glossary

Zone I: The area closest to a well; a 100 to 400 foot radius proportional to the well's pumping rate. To determine your Zone I radius, refer to the attached map.

IWPA: A 400-foot to ½ mile radius around a public water supply well proportional to its pumping rate; the area DEP recommends for protection in the absence of a defined Zone II. To determine IWPA radius, refer to the attached map.

Zone II: The primary recharge area defined by a hydrogeologic study.

Aquifer: An underground water-bearing layer of permeable material that will yield water in a usable quantity to a well.

Hydrogeologic Barrier: An underground layer of impermeable material that resists penetration by water.

Recharge Area: The surface area that contributes water to a well.

What is Susceptibility?

Susceptibility is a measure of a well's potential to become contaminated due to land uses and activities within the Zone I and Interim Wellhead Protection Area (IWPA).

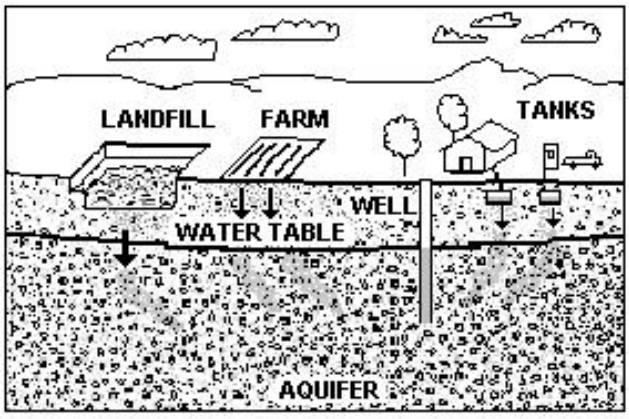

Figure 1: Example of how a well could become contaminated by different land uses and activities.

- Inspect the abandoned casing near the cluster of wells to ensure the casing is secure and the ground around the casing is sloped to prevent infiltration along the casing annulus. Consider developing a long-term plan to decommission the boring in the future to prevent accidental contamination of the aquifer through that boring.
- Where it is feasible, remove all hazardous materials from Zone I including household hazardous materials. Use BMPs for the storage, use, and disposal of hazardous materials such as water supply chemicals, maintenance chemicals and vehicles used to access the area. Include all pool chemicals in you management plans.
- Do not use or store pesticides, fertilizers or road deicing materials within the Zone I.
- Ensure that residents are aware of best management practices (BMPs) with respect to hazardous materials handling, household hazardous materials handling and disposal and proper use of lawn chemicals.
- Short term and long term plans must consider wastewater and water supply protection options. Consider consolidation of the system, relocation of source(s) and wastewater disposal options.

2. Residential Land Uses – The Zone Is for some of the wells and IWPAs for all of the wells have high-density residential land use. If managed improperly, activities associated with residential areas can contribute to drinking water contamination. Common potential sources of contamination include:

- **Household Hazardous Materials** - Hazardous materials may include automotive wastes, paints, solvents, pesticides, fertilizers, and other substances. Improper use, storage, and disposal of chemical products used in homes are potential sources of contamination.
- **Heating Oil Storage** - If managed improperly, Underground and Aboveground Storage Tanks (USTs and ASTs) can be potential sources of contamination due to leaks or spills of the fuel oil they store and accidents during delivery.
- **Stormwater** – Catch basins transport stormwater from roadways and adjacent properties to the ground and streams. As flowing stormwater travels, it picks up debris and contaminants from streets and lawns. Common potential contaminants include lawn chemicals, pet waste, and contaminants from automotive leaks, maintenance, washing, or accidents. Visit the Nonpoint Source pollution web site for additional information at http://www.state.ma.us/dep/brp/wm/nonpoint.htm.

Residential Land Use Recommendations:

- Educate residents on best management practices (BMPs) for protecting water supplies. Distribute the fact sheet "Residents Protect Drinking Water" available in Appendix A and on www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common residential issues.

3. Transportation corridors – The access road and Route 9 are located within the Zone I and/or IWPA of the wells. Accidents and normal use and maintenance of roads pose a potential threat to water quality. As flowing stormwater travels, it picks up de-icing materials, petroleum chemicals and other debris on roads and contaminants from streets and lawns. Common potential contaminants in stormwater originate from automotive leaks, automobile maintenance and car washing, accidental spills as well as waste from wildlife and pets.

Recommendations:

- Inspect the roadways to determine the discharge points of road runoff, as is feasible, for well 08G and 09G. If it is determined that runoff discharges toward the wells, consider modifying the ground surface around the well casings to ensure that stormwater does not discharge near the wells.
- Prepare an Emergency Response Plan that includes coordination between the DEP, the Association, and the Town emergency response (ER) team in the event of an accident near the wellhead. The Town ER team should be made aware of the location of your water system so that they can notify you in the event of an accident near your system.

For More Information:

Contact Catherine V. Skiba in DEP's Springfield Office at (413) 755-2119 for more information and for assistance in improving current protection measures.

More information relating to drinking water and source protection is available on the Drinking Water Program web site at: www.state.ma.us/dep/brp/dws/

Additional Documents:

To help with source protection efforts, more information is available by request or online at www.state.ma.us/dep/brp/dws, including:

1. Water Supply Protection Guidance Materials such as model regulations, Best Management Practice information, and general water supply protection information.
2. MA DEP SWAP Strategy
3. Land Use Pollution Potential Matrix
4. Draft Land/Associated Contaminants Matrix

Copies of this assessment have been made available to the public water supplier, town boards, and the local media.

4. Hazardous Materials Storage and Use – Within the IWPA of Well 09G, there is at least one commercial facility that stores or utilizes hazardous materials. In addition, portions of a gravel operation are located within the IWPA of several of the wells: 01G through 04G. Many businesses use hazardous materials, produce hazardous waste products, and/or store quantities of hazardous materials. If hazardous materials are improperly stored, used, or disposed, they become potential sources of contamination. Hazardous materials should never be allowed to enter a catch basin, septic system or floor drain leading directly to the ground. Gravel operations in and of themselves do not necessarily impact water supplies. However, proximity of excavation to the water table, use, storage and refueling of heavy equipment in a gravel pit pose a risk from petroleum products. Gravel pits can be sites of illegal disposal of potentially hazardous materials unless access is controlled.

Hazardous Materials Storage and Use Recommendations:

- Educate local businesses and municipal departments regarding the use of best management practices for protecting water supplies. Distribute the fact sheets "Businesses Protect Drinking Water" and "DPWs Protect Drinking Water" available in Appendix A; they are also available online at the DEP website www.mass.gov/dep/brp/dws/protect.htm, which provides BMPs for common business issues.
- Work with the local Board of Health, the municipality and businesses to register facilities that are unregistered generators of hazardous waste or waste oil. Partnerships between businesses, water suppliers, and communities enhance successful public drinking water protection practices.
- Educate local businesses and town officials and assist the Board of Health in understanding the Massachusetts and local floordrain requirements. See the brochure "Industrial Floor Drains" for more information.

5. Comprehensive Protection Planning – Protection planning protects drinking water by managing the land area that supplies water to a well or reservoir. Belchertown does has aquifer protection bylaws and health regulations. Although the protection measures are not fully in compliance with DEP requirements, according to the health agent, the Board will be considering suggested revisions to bring the regulations into compliance with the DEP requirements. Wellhead protection planning identifies protection strategies and establishes a timeframe for implementation. The Association has a number of issues to address for short and long term planning for protection of the water supplies and a Wellhead Protection Plan could be a useful tool for organizing a strategy for future protection.

Protection Planning Recommendations:

- Consider preparing a Wellhead Protection Plan. Contact Northeast Rural Water Association for some assistance in developing a comprehensive plan.
- For short and long term planning, the Association should consider consulting with a professional to review all water and wastewater issues at the facility.

3. Protection Recommendations

Implementing protection measures and best management practices (BMPs) will further enhance the protection of the well and minimize its susceptibility to contamination. The Association should carefully review and adopt the key recommendations above and the following:

Priority Recommendations:

- Conduct a comprehensive review of water and wastewater issues at the facility.
- Monitor activities near the wells. Use BMPs and avoid the use and misuse of household hazardous materials near the wells, especially those proximal to homes.

Zone I:

- Keep non-water supply activities out of the Zone I.
- Conduct regular inspections of the Zone I. Look for illegal dumping, evidence of access or vandalism.
- If it's not feasible to purchase privately owned land within the Zone I at this time, consider a conservation restriction that

would prohibit potentially threatening activities, a Memorandum of Understanding or a Right of First Refusal to purchase the property. Consider consolidating sources and utilize the most protected source with consistant, good water quality.
- Redirect road drainage in the Zone I away from well area.
- Do not use or store pesticides, fertilizers or road deicing materials within the Zone I.

Training and Education:
- Train staff on proper hazardous material use, disposal, emergency response, and best management practices. Post labels as appropriate on raw materials and hazardous waste.
- Post drinking water protection area signs at key visibility locations away from the immediate wellhead area.
- Inform neighbors and consumers regarding BMPs with respect to household hazardous materials handling and disposal and septic system maintenance.

Planning:
- Have a plan to address short-term water shortages and long-term water demands and wastewater issues.
- Keep the phone number of a bottled water company readily available in the event of an emergency.
- Work with the Board of Health in their continuing efforts to adopt floor drain regulations and aquifer protection regulations.

Funding:
The Department's Wellhead Protection Grant Program provides funds to assist public water suppliers in addressing Wellhead protection through local projects. Protection recommendations discussed in this document may be eligible for funding under the "Wellhead Protection Grant Program". For additional information, please refer to the attached program fact sheet. If funding is available, the Department posts a new Request for Response for the Grant program (RFR). Funding opportunities are described in "Grant and Loan Programs: Opportunities for Watershed Protection, Planning and Implementation" at http://www.state.ma.us/dep/brp/mf/files/glprgm.pdf.

These recommendations are only part of your ongoing local drinking water source protection. Citizens and community officials should use this SWAP report to encourage discussion of local drinking water protection measures.

4. Attachments

- Map of the Public Water Supply (PWS) Protection Area
- Recommended Source Protection Measures Fact sheets

W:\… \Belchertown 1024016 SWAP 2003-10-08-02

APPENDIX B:
REGULATED FACILITIES WITHIN THE WATER SUPPLY PROTECTION AREAS

DEP Permitted Facilities

DEP Facility Number	Facility Name	Street Address	Town	Permitted Activity	Activity Class	Facility Description
MAV000015090	Dory Jeep	Ware Road	Belchertown	Hazardous Waste Generator	VSQG	Sale & Service
MV4133235435	Devon Lane Power Equipment	Ware Road	Belchertown	Hazardous Waste Generator	VSQG	Sales & Service
MAV000016693	H F Greene & Son	Ware Road	Belchertown	Hazardous Waste Generator	VSQG	Construction

Note: This appendix includes only those facilities within the water supply protection area(s) that meet state reporting requirements and report to the appropriate agencies. Additional facilities may be located within the water supply protection area(s) that should be considered in local drinking water source protection planning.

W:\SWAPPUB\Belchertown 1024016 SWAP 2003-10-08-03.doc